

92. (New) The vaccine according to claim 84, wherein the nucleotide sequence encoding the immunogen of the bovine pathogen has deleted therefrom a portion encoding a transmembrane domain.

93. (New) The vaccine according to claim 84, wherein the plasmid further contains and expresses in a bovine host cell a nucleotide sequence encoding a heterologous tPA signal sequence.

94. (New) The vaccine according to claim 84, wherein the plasmid further contains a stabilizing intron.

95. (New) The vaccine according to claim 94, wherein the intron is intron II of a rabbit beta-globin gene.

96. (New) The vaccine according to claim 84, wherein the bovine pathogen is bovine respiratory syncytial virus (BRSV).

97. (New) The vaccine according to claim 96, wherein the immunogen is BRSV F, modified by substitution of the BRSV F signal sequence with a human tPA signal sequence, and/or by deletion of the transmembrane domain.

98. (New) The vaccine according to claim 96, the immunogen is BRSV G, modified by substitution of the BRSV G signal sequence with a human tPA signal sequence, and/or by deletion of the transmembrane domain.

99. (New) The vaccine according to claim 85 comprising a first plasmid that contains and expresses in a bovine host cell a nucleotide sequence encoding bovine respiratory syncytial virus (BRSV) F, modified by substitution of the BRSV F signal sequence with a human tPA signal sequence and deletion of the transmembrane domain and contiguous C-terminal portion; and a second plasmid that contains and expresses in a bovine host cell a nucleotide sequence encoding BRSV G, modified by substitution of the BRSV G signal sequence with a human tPA signal sequence and deletion of the transmembrane domain and contiguous C-terminal portion; and wherein the lipid is DMRIE, whereby the vaccine comprises DMRIE-DOPE.

100. (New) The vaccine according to claim 92, further comprising DOPE.

101. (New) The vaccine according to claim 92, further comprising bovine GM-CSF.

102. (New) The vaccine according to claim 92, further comprising an expression vector that contains and expresses in a bovine host cell a nucleotide sequence encoding bovine GM-CSF.

103. (New) The vaccine according to claim 102, wherein the expression vector is a plasmid.

104. (New) The vaccine according to claim 93, further comprising DOPE.

105. (New) The vaccine according to claim 93, further comprising bovine GM-CSF.

106. (New) The vaccine according to claim 93, further comprising an expression vector that contains and expresses in a bovine host cell a nucleotide sequence encoding bovine GM-CSF.

107. (New) The vaccine according to claim 106, wherein the expression vector is a plasmid.

108. (New) The vaccine according to claim 94, further comprising DOPE.

109. (New) The vaccine according to claim 94, further comprising bovine GM-CSF.

110. (New) The vaccine according to claim 94, further comprising an expression vector that contains and expresses in a bovine host cell a nucleotide sequence encoding bovine GM-CSF.

111. (New) The vaccine according to claim 110, wherein the expression vector is a plasmid.

112. (New) The vaccine according to claim 96, further comprising DOPE.

113. (New) The vaccine according to claim 96, further comprising bovine GM-CSF.

114. (New) The vaccine according to claim 96, further comprising an expression vector that contains and expresses in a bovine host cell a nucleotide sequence encoding bovine GM-CSF.

115. (New) The vaccine according to claim 114, wherein the expression vector is a plasmid.

116. (New) The vaccine of claim 96 wherein the immunogen is BRSV F.

117. (New) The vaccine of claim 96 wherein the immunogen is BRSV G.

118. (New) The vaccine according to claim 84 wherein the lipid is DMRIE.

119. (New) The vaccine according to claim 84, wherein the bovine pathogen is bovine herpesvirus type 1 (BHV-1)

120. (New) The vaccine according to claim 119 wherein the immunogen is BHV-1 gB.

121. (New) The vaccine according to claim 119 wherein the immunogen is BHV-1 gC.

122. (New) The vaccine according to claim 119 wherein the immunogen is BHV-1 gD.

123. (New) The vaccine according to claim 119, wherein the immunogen is BHV-1 gB, modified by substitution of the BHV-1 gB signal sequence with a human tPA signal sequence, and/or by deletion of the transmembrane domain.

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124. (New) The vaccine according to claim 119, the immunogen is BHV-1 gC, modified by substitution of the BHV-1 gC signal sequence with a human tPA signal sequence, and/or by deletion of the transmembrane domain.

125. (New) The vaccine according to claim 119, the immunogen is BHV-1 gD, modified by substitution of the BHV-1 gD signal sequence with a human tPA signal sequence, and/or by deletion of the transmembrane domain.

126. (New) The vaccine according to claim 85 comprising a first plasmid that contains and expresses in a bovine host cell a nucleotide sequence encoding bovine herpesvirus type 1 (BHV-1) gB, modified by substitution of the BHV-1 gB signal sequence with a human tPA signal sequence and deletion of the transmembrane domain and contiguous C-terminal portion; a second plasmid that contains and expresses in a bovine host cell a nucleotide sequence encoding BHV-1 gC, modified by substitution of the BHV-1 gC signal sequence with a human tPA signal sequence and deletion of the transmembrane domain and contiguous C-terminal portion; and a third plasmid that contains and expresses in a bovine host cell a nucleotide sequence encoding BHV-1 gD, modified by substitution of the BHV-1 gD signal sequence with a human tPA signal sequence and deletion of the transmembrane domain and contiguous C-terminal portion; and wherein the lipid is DMRIE, whereby the vaccine comprises DMRIE-DOPE.

127. (New) The vaccine according to claim 119, further comprising DOPE.

128. (New) The vaccine according to claim 119, further comprising bovine GM-CSF.

129. (New) The vaccine according to claim 119, further comprising an expression vector that contains and expresses in a bovine host cell a nucleotide sequence encoding bovine GM-CSF.

130. (New) The vaccine according to claim 129, wherein the expression vector is a plasmid.

131. (New) The vaccine according to claim 84, wherein the bovine pathogen is bovine viral diarrhea virus (BVDV).

132. (New) The vaccine according to claim 131, wherein the immunogen is BVDV EO.

133. (New) The vaccine according to claim 131, wherein the immunogen is BVDV E2.

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134. (New) The vaccine according to claim 131, the immunogen is BVDV EO, modified by substitution of the BVDV EO signal sequence with a human tPA signal sequence, and/or by the nucleotide sequence including intron II of a rabbit beta-globin gene upstream of coding for BVDV EO.

135. (New) The vaccine according to claim 131, the immunogen is BVDV E2, modified by substitution of the BVDV E2 signal sequence with a human tPA signal sequence, and/or by the nucleotide sequence including intron II of a rabbit beta-globin gene upstream of coding for BVDV E2.

136. (New) The vaccine according to claim 85 comprising a first plasmid that contains and expresses in a bovine host cell a nucleotide sequence encoding bovine viral diarrhea virus (BVDV) EO, modified by substitution of the BVDV EO signal sequence with a human tPA signal sequence, and by the nucleotide sequence including intron II of a rabbit beta-globin gene upstream of coding for BVDV EO; and a second plasmid that contains and expresses in a bovine host cell a nucleotide sequence encoding BVDV E2, modified by substitution of the BVDV E2 signal sequence with a human tPA signal sequence, and by the nucleotide sequence including intron II of a rabbit beta-globin gene upstream of coding for BVDV E2; and wherein the lipid is DMRIE, whereby the vaccine comprises DMRIE-DOPE.

137. (New) The vaccine according to claim 131, further comprising DOPE.

138. (New) The vaccine according to claim 131, further comprising bovine GM-CSF.

139. (New) The vaccine according to claim 131, further comprising an expression vector that contains and expresses in a bovine host cell a nucleotide sequence encoding bovine GM-CSF.

140. (New) The vaccine according to claim 139, wherein the expression vector is a plasmid.

141. (New) The vaccine according to claim 84, wherein the bovine pathogen is bovine parainfluenza virus type 3 (bPI-3).

142. (New) The vaccine according to claim 141, wherein the immunogen is bPI-3 HN.

143. (New) The vaccine according to claim 141, wherein the immunogen is bPI-3 F.

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144. (New) The vaccine according to claim 141, the immunogen is bPI-3 HN, modified by substitution of the bPI-3 HN signal sequence with a human tPA signal sequence, and/or by deletion of the transmembrane domain and/or by the nucleotide sequence including intron II of a rabbit beta-globin gene upstream of coding for bPI-3 HN.

145. (New) The vaccine according to claim 141, the immunogen is bPI-3 F, modified by substitution of the bPI-3 F signal sequence with a human tPA signal sequence, and/or by deletion of the transmembrane domain and/or by the nucleotide sequence including intron II of a rabbit beta-globin gene upstream of coding for bPI-3 F.

146. (New) The vaccine according to claim 85 comprising a first plasmid that contains and expresses in a bovine host cell a nucleotide sequence encoding bovine parainfluenza virus type 3 (bPI-3) HN, modified by substitution of the bPI-3 HN signal sequence with a human tPA signal sequence, and by deletion of the transmembrane domain and contiguous C-terminal portion, and by the nucleotide sequence including intron II of a rabbit beta-globin gene upstream of coding for bPI-3 HN; a second plasmid that contains and expresses in a bovine host cell a nucleotide sequence encoding bPI-3 HN, modified by substitution of the bPI-3 HN signal sequence with a human tPA signal sequence, and by deletion of the transmembrane domain and contiguous C-terminal portion, and by the nucleotide sequence including intron II of a rabbit beta-globin gene upstream of coding for bPI-3 HN; and wherein the lipid is DMRIE, whereby the vaccine comprises DMRIE-DOPE.

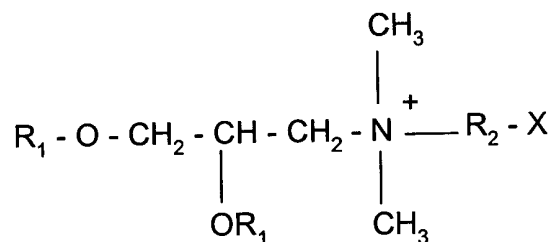
147. (New) The vaccine according to claim 141, further comprising DOPE.

148. (New) The vaccine according to claim 141, further comprising bovine GM-CSF.

149. (New) The vaccine according to claim 141, further comprising an expression vector that contains and expresses in a bovine host cell a nucleotide sequence encoding bovine GM-CSF.

150. (New) The vaccine according to claim 149, wherein the expression vector is a plasmid.

151. (New) A DNA vaccine against a porcine pathogen comprising at least one plasmid that contains and expresses in a porcine host cell a nucleotide sequence encoding an immunogen of the porcine pathogen, and a cationic lipid containing a quaternary ammonium salt, of the formula



in which R₁ is a saturated or unsaturated linear aliphatic radical having 12 to 18 carbon atoms, R₂ is an aliphatic radical containing 2 or 3 carbon atoms, and X a hydroxyl or amine group.

152. (New) The vaccine according to claim 151, further comprising DOPE.

153. (New) The vaccine according to claim 151, further comprising porcine GM-CSF.

154. (New) The vaccine according to claim 152, further comprising porcine GM-CSF.

155. (New) The vaccine according to claim 151, further comprising an expression vector that contains and expresses in a porcine host cell a nucleotide sequence encoding porcine GM-CSF.

156. (New) The vaccine according to claim 152, further comprising an expression vector that contains and expresses in a porcine host cell a nucleotide sequence encoding porcine GM-CSF.

157. (New) The vaccine according to claim 155, wherein the expression vector is a plasmid.

158. (New) The vaccine according to claim 156, wherein the expression vector is a plasmid.

159 (New) The vaccine according to claim 151, wherein the nucleotide sequence encoding the immunogen of the porcine pathogen has deleted therefrom a portion encoding a transmembrane domain.

160. (New) The vaccine according to claim 151, wherein the plasmid further contains and expresses in a porcine host cell a nucleotide sequence encoding a heterologous tPA signal sequence.

161. (New) The vaccine according to claim 151, wherein the plasmid further contains a stabilizing intron.

162. (New) The vaccine according to claim 161, wherein the intron is intron II of a rabbit beta-globin gene.

163. (New) The vaccine according to claim 151, wherein the porcine pathogen is pseudorabies virus (PRV).

164. (New) The vaccine according to claim 163, wherein the immunogen is PRV gB.

165. (New) The vaccine according to claim 163, wherein the immunogen is PRV gC.

166. (New) The vaccine according to claim 163, wherein the immunogen is PRV gD.

167. (New) The vaccine according to claim 163, the immunogen is PRV gB, modified by substitution of the PRV gB signal sequence with a human tPA signal sequence, and/or by deletion of the transmembrane domain.

168. (New) The vaccine according to claim 163, the immunogen is PRV gC, modified by substitution of the PRV gC signal sequence with a human tPA signal sequence, and/or by deletion of the transmembrane domain.

169. (New) The vaccine according to claim 163, the immunogen is PRV gD, modified by substitution of the PRV gD signal sequence with a human tPA signal sequence, and/or by deletion of the transmembrane domain.

170. (New) The vaccine according to claim 152 comprising a first plasmid that contains and expresses in a porcine host cell a nucleotide sequence encoding pseudorabies virus (PRV) gB, modified by substitution of the PRV gB signal sequence with a human tPA signal sequence, and by deletion of the transmembrane domain and contiguous C-terminal portion; a second plasmid that contains and expresses in a porcine host cell a nucleotide sequence encoding PRV gC, modified by substitution of the PRV gC signal sequence with a human tPA

signal sequence, and by deletion of the transmembrane domain and contiguous C-terminal portion; and a third plasmid that contains and expresses in a porcine host cell a nucleotide sequence encoding PRV gD, modified by substitution of the PRV gD signal sequence with a human tPA signal sequence, and by deletion of the transmembrane domain and contiguous C-terminal portion; and wherein the lipid is DMRIE, whereby the vaccine comprises DMRIE-DOPE.

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171. (New) The vaccine according to claim 163, further comprising DOPE.
 172. (New) The vaccine according to claim 163, further comprising porcine GM-CSF.
 173. (New) The vaccine according to claim 163, further comprising an expression vector that contains and expresses in a porcine host cell a nucleotide sequence encoding porcine GM-CSF.
 174. (New) The vaccine according to claim 173, wherein the expression vector is a plasmid.
 175. (New) The vaccine according to claim 151, wherein the porcine pathogen is porcine reproductive respiratory syndrome virus (PRSV).
 176. (New) The vaccine according to claim 175, wherein the immunogen is PRSV ORF3.
 177. (New) The vaccine according to claim 175, wherein the immunogen is PRSV ORF5.
 178. (New) The vaccine according to claim 175, wherein the immunogen is PRSV ORF6.
 179. (New) The vaccine according to claim 175, the immunogen is PRSV ORF3, modified by substitution of the PRSV ORF3 signal sequence with a human tPA signal sequence, and/or by deletion of the transmembrane domain.
 180. (New) The vaccine according to claim 175, the immunogen is PRSV ORF5, modified by substitution of the PRSV ORF5 signal sequence with a human tPA signal sequence, and/or by deletion of the transmembrane domain.
 181. (New) The vaccine according to claim 175, the immunogen is PRSV ORF6, modified by substitution of the PRSV ORF6 signal sequence with a human tPA signal sequence, and/or by deletion of the transmembrane domain.

182. (New) The vaccine according to claim 152 comprising a first plasmid that contains and expresses in a porcine host cell a nucleotide sequence encoding porcine reproductive respiratory syndrome virus (PRSV) ORF3, modified by substitution of the PRSV ORF3 signal sequence with a human tPA signal sequence, and by deletion of the transmembrane domain and contiguous C-terminal portion; a second plasmid that contains and expresses in a in a porcine host cell a nucleotide sequence encoding PRSV ORF5, modified by substitution of the PRSV ORF5 signal sequence with a human tPA signal sequence, and by deletion of the transmembrane domain and contiguous C-terminal portion; and a third plasmid that contains and expresses in a in a porcine host cell a nucleotide sequence encoding PRSV ORF6, modified by substitution of the PRSV ORF6 signal sequence with a human tPA signal sequence, and by deletion of the transmembrane domain and contiguous C-terminal portion; and wherein the lipid is DMRIE, whereby the vaccine comprises DMRIE-DOPE.

183. (New) The vaccine according to claim 175, further comprising DOPE.

184. (New) The vaccine according to claim 175, further comprising porcine GM-CSF.

185. (New) The vaccine according to claim 175, further comprising an expression vector that contains and expresses in a porcine host cell a nucleotide sequence encoding porcine GM-CSF.

186. (New) The vaccine according to claim 185, wherein the expression vector is a plasmid.

187. (New) The vaccine according to claim 151, wherein the porcine pathogen is swine influenza virus (SIV).

188. (New) The vaccine according to claim 187, wherein the immunogen is SIV HA.

189. (New) The vaccine according to claim 187, wherein the immunogen is SIV NA.

190. (New) The vaccine according to claim 187, the immunogen is SIV HA, modified by substitution of the SIV HA signal sequence with a human tPA signal sequence, and/or by deletion of the transmembrane domain and/or by the nucleotide sequence including intron II of a rabbit beta-globin gene upstream of coding for SIV HA.

191. (New) The vaccine according to claim 187, the immunogen is SIV NA, modified by substitution of the SIV NA signal sequence with a human tPA signal sequence, and/or by

deletion of the transmembrane domain and/or by the nucleotide sequence including intron II of a rabbit beta-globin gene upstream of coding for SIV NA.

192. (New) The vaccine according to claim 152 comprising a first plasmid that contains and expresses in a porcine host cell a nucleotide sequence encoding swine influenza virus (SIV) HA, modified by substitution of the SIV HA signal sequence with a human tPA signal sequence, and by deletion of the transmembrane domain and contiguous C-terminal portion and by the nucleotide sequence including intron II of a rabbit beta-globin gene upstream of coding for SIV HA; and a second plasmid that contains and expresses in a in a porcine host cell a nucleotide sequence encoding SIV NA, modified by substitution of the SIV NA signal sequence with a human tPA signal sequence, and by deletion of the transmembrane domain and contiguous C-terminal portion and by the nucleotide sequence including intron II of a rabbit beta-globin gene upstream of coding for SIV NA; and wherein the lipid is DMRIE, whereby the vaccine comprises DMRIE-DOPE.

193. (New) The vaccine according to claim 187, further comprising DOPE.

194. (New) The vaccine according to claim 187, further comprising porcine GM-CSF.

195. (New) The vaccine according to claim 187, further comprising an expression vector that contains and expresses in a porcine host cell a nucleotide sequence encoding porcine GM-CSF.

196. (New) The vaccine according to claim 195, wherein the expression vector is a plasmid.

197. (New) The vaccine according to claim 151, wherein the porcine pathogen is hog cholera virus (HCV).

198. (New) The vaccine according to claim 197, wherein the immunogen is HCV E1.

199. (New) The vaccine according to claim 197, wherein the immunogen is HCV E2.

200. (New) The vaccine according to claim 197, wherein the lipid is DMRIE and the vaccine further comprising DOPE, whereby the vaccine comprises DMRIE-DOPE.

201. (New) The vaccine according to claim 197, further comprising porcine GM-CSF.

202. (New) The vaccine according to claim 197, further comprising an expression vector that contains and expresses in a porcine host cell a nucleotide sequence encoding porcine GM-CSF.

203. (New) The vaccine according to claim 202, wherein the expression vector is a plasmid.

204. (New) The vaccine according to claim 151, wherein the porcine pathogen is porcine parvovirus.

205. (New) The vaccine according to claim 204, wherein the immunogen is porcine parvovirus VP2.

206. (New) The vaccine according to claim 204, wherein the lipid is DMRIE and the vaccine further comprising DOPE, whereby the vaccine comprises DMRIE-DOPE.

207. (New) The vaccine according to claim 204, further comprising porcine GM-CSF.

208. (New) The vaccine according to claim 204, further comprising an expression vector that contains and expresses in a porcine host cell a nucleotide sequence encoding porcine GM-CSF.

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209. (New) The vaccine according to claim 208, wherein the expression vector is a plasmid.

210. (New) A method for inducing an immunological response against a bovine pathogen in a bovine comprising administering to the bovine the vaccine of claim 84.

211. (New) A method for inducing an immunological response against BRSV in a bovine comprising administering to the bovine the vaccine of claim 96.

212. (New) A method for inducing an immunological response against BHV-1 in a bovine comprising administering to the bovine the vaccine of claim 119.

213. (New) A method for inducing an immunological response against BVDV in a bovine comprising administering to the bovine the vaccine of claim 131.

214. (New) A method for inducing an immunological response against bPI-3 in a bovine comprising administering to the bovine the vaccine of claim 141

215. (New) A method for inducing an immunological response against a porcine pathogen in a porcine comprising administering to the porcine the vaccine of claim 151.

216. (New) A method for inducing an immunological response against PRV in a porcine comprising administering to the porcine the vaccine of claim 163.

217. (New) A method for inducing an immunological response against PRSV in a porcine comprising administering to the porcine the vaccine of claim 175.

218. (New) A method for inducing an immunological response against SIV in a porcine comprising administering to the porcine the vaccine of claim 187.

219. (New) A method for inducing an immunological response against HCV in a porcine comprising administering to the porcine the vaccine of claim 197.

220. (New) A method for inducing an immunological response against porcine parvovirus in a porcine comprising administering to the porcine the vaccine of claim 204.--

Please cancel claims 1-83, without prejudice, without admission, without surrender of subject matter and without intention of creating any estoppel as to equivalents.